

ANALYSIS OF SO₂ SIGNALS IN SBUV/TOMS DATA

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Absorption bands between 300 nm and 315 nm were observed in spectral scans of the atmospheric albedo made by SBUV following the eruption of El Chichon. We show that these bands coincide with peaks in the absorption coefficient spectrum of SO₂ and use the magnitude of the absorption to estimate the column content of SO₂ present. These observations confirm that the differential absorption between 312.5 nm and 317.5 nm in TOMS data can be used to measure SO₂ with high spatial resolution. A maximum concentration of SO₂ of 15 matm-cm was observed by SBUV on April 15, 1982. The measurement based on direct measurement of band intensity can be used to calibrate the TOMS algorithm for deriving SO₂ amounts.

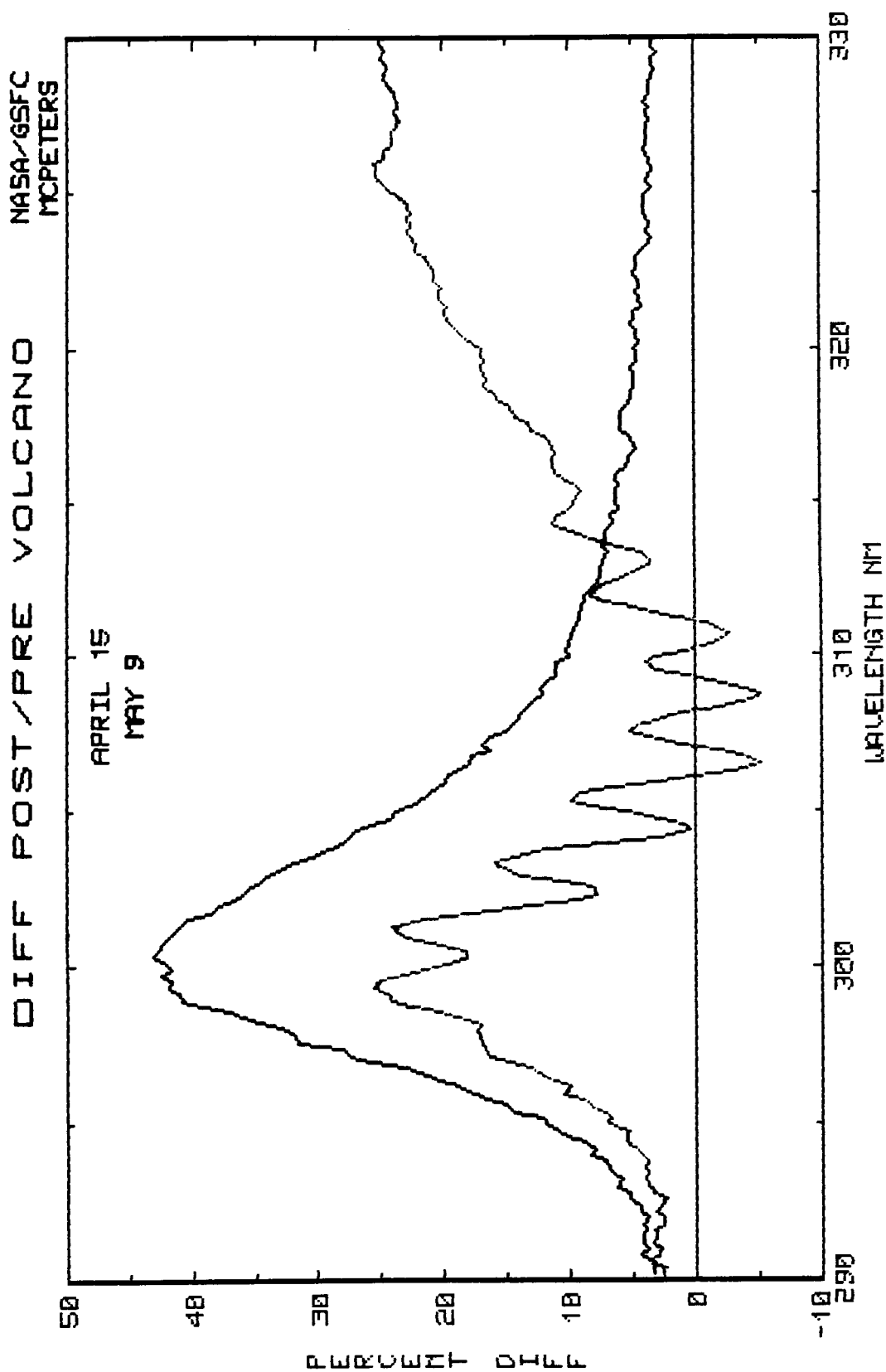


Figure 1. THE PERCENT DIFFERENCE BETWEEN THE MEASURED ALBEDO BEFORE AND AFTER THE ERUPTION OF EL CHICHON. THE LIGHT CURVE IS A SCAN ON APRIL 15, 1982, WITH STRONG SO₂ BAND STRUCTURE, WHILE THE DARK CURVE IS A SCAN ON MAY 9 SHOWING ENHANCED SCATTERING NEAR 300 nm CAUSED BY AEROSOLS.

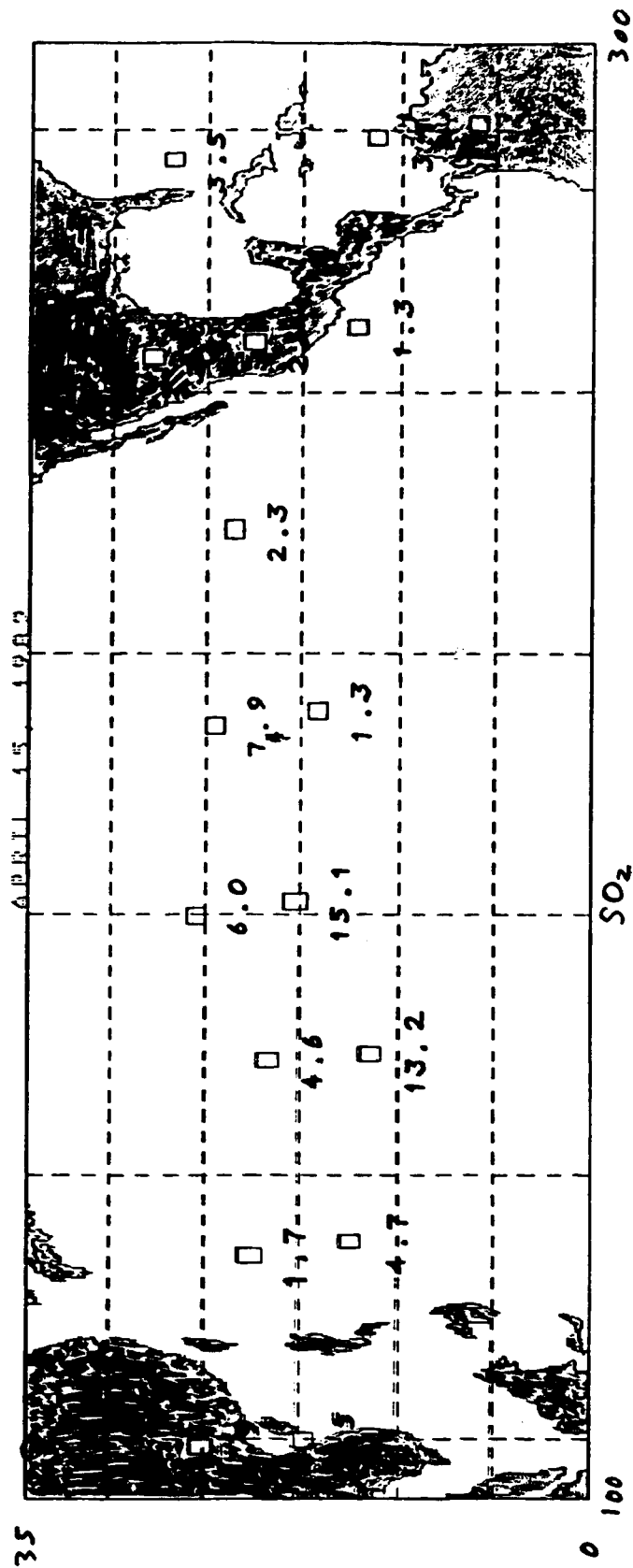


Figure 2. SO₂ AMOUNTS (m-atm-cm) DETERMINED FROM SBUV SPECTRAL SCAN MEASUREMENTS.